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PREPARATION OF A COMPLETE AND EXHAUSTIVE FILE OF RESEARCH ABSTRACTS IN THE EDUCATIONAL MEDIA FIELD.

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THE COMPILATION OF A FILE OF MEDIA RESEARCH LITERATURE, COVERING THE PERIOD FROM 1920 TO 1965, FOR USE WITH A COMPUTERIZED INFORMATION RETRIEVAL SYSTEM WAS DESCRIBED. PERIODICAL, NONPERIODICAL, PUBLISHED, AND UNPUBLISHED LITERATURE IN A NUMBER OF FIELDS WAS SCANNED. THE PROCEDURE WAS ONE OF FOLLOWING LEADS INDICATED BY REFERENCES ACCOMPANYING CURRENT REPORTS INTO AN EXPANDING CIRCLE OF RELATED STUDIES. AT THE SAME TIME, PRODUCTIVE SOURCES WERE INVESTIGATED SYSTEMATICALLY FOR THE PURPOSE OF IDENTIFYING THOSE DOCUMENTS TO WHICH REFERENCE HAD NOT BEEN MADE. THIS REPORT SHOWS TABULATIONS OF ALL DOCUMENTS ABSTRACTED FOR THE SYSTEM WITH RESPECT TO SOURCE AND DATE OF ISSUE, BUT DOES NOT PROVIDE A DOCUMENT LISTING OR ANY ABSTRACTS. (FOR ADDITIONAL INFORMATION, REFER TO ACCESSION NUMBERS ED 003 777 AND ED 010 239.) (JH)

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Preparation of a Complete and Exhaustive File of Research Abstracts in the Educational Media Field

Title VII Project B-170a

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Abstract

The compilation of a file of media research literature covering the period from 1920 to the present time, for exploitation by a computerized information retrieval system, has involved scanning both periodical and non-periodical, published and unpublished literature in a number of fields. The procedure has been one of following leads indicated by references accompanying current reports into a wider and wider circle of related studies. At the same time productive sources have been investigated systematically for the purpose of identifying those documents to which reference has not been made.

Documents abstracted are tabulated with respect to both source and date of issue. Data are represented graphically.

A very general statement of the meaning of education, as the term is used in Title VII of the NDEA, a list of educational media to be considered, and certain limitations on experimental populations and materials were furnished by the U. S. Office of Education. The individual decisions involved in literature selection necessitated specification of criteria. Tentative results are set forth here.

Media-relatedness has been established for operational purposes by logical inference and by analysis of areas of reference. It is, however, only in terms of the needs of the user population that any final demarcations can be approached.

Introduction

Although certain aspects of information retrieval systems, notably the development of abstracting, indexing and coding techniques, receive more attention in published reports than the seemingly routine aspects of acquisitions and inclusion criteria, the effective development of the latter two is extremely important to the design of the total system.

Acquisition procedures are defined as those procedures for locating, ordering and examining source material which has potential value for a collection. Inclusion criteria are those rules established by the system operator to permit an objective and comprehensive selection of acquired material closely related to the needs of the users of a system.

This report details acquisition procedures and preliminary inclusion criteria developed for an Educational Media Research Information Center, and is based on the work conducted under contract from the Office of Education in 1961-1962.*

Although treated somewhat independently in this report, the two aspects are very closely related, and their development is simultaneous. In the section on acquisition procedures it will be seen that certain decisions relevant to criteria are included, e.g., type of research included, physical form of material acquired, etc. In the section on inclusion criteria it is apparent that much of the work in acquisitions, e.g., journals to be scanned, chronological period to be covered, and type of source material for abstracting and indexing, hinges on the decisions in regard to criteria.

Acquisition procedures need no further introduction, but some additional remarks are necessary concerning the development of inclusion criteria.

Until a system becomes fully operational, and until the system operator has specific data on the real needs of the users of a system, almost any decision

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* Cooperative Research Project 1298 and Title VII Project B-170.

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regarding the inclusion or exclusion of material in a file is arbitrary and subjective. That is not to say that the decisions are easily made; they are not. They are the result of discussing broad policy lines with the U.S. Office of Education. They are the result of day to day judgments on candidate documents. They are preliminary formulations which provide a starting point for the development of a rationale for inclusion, a rationale which, in a field such as educational media research, extends into wide and diverse areas of educational research.

An integral part of the work under this contract, in addition to the above, has been the abstracting, indexing, and recording in machine searchable form, of all the documents meeting the present criteria. Each one has been processed according to the procedures given in detail in The Library of Tomorrow-Today.* Where revision of these procedures seemed necessary, an adjustment was made to reflect the Center's rapidly accumulating experience in the development of an Educational Research Information Center.

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* Reeves, Pamela W., A. J. Goldwyn, Jessica S. Melton and Allen Kent, The Library of Tomorrow-Today, An Information Service of Educational Research Materials: U.S. Office of Education Cooperative Research Project No. 1298 and Title VII Project B-170, 1962.

I Acquisitions

Between the decision to build a file of retrievable information and the actual recording of that information on magnetic tape are many challenging but tedious steps, many hours, and many decisions, each of which affects the quality of the final product.

The time period covered by the educational media research file at the Center for Documentation and Communication Research is from 1920 to the present. Effort has been made to document this period exhaustively by locating, abstracting and recording both published and unpublished studies in the field and in related areas.

The material included in the file is described as "research", but "research" is a word covering far too much territory and so has had to be defined for this project. For the Center's purposes it means controlled experiment, the reporting of which is accompanied by quantified data, and reviews of such research if they collate findings so as to make a contribution to the thinking in a particular area. In addition to the laboratory type of study, the survey type is also included. However, there are many written and even published surveys that amount to little more than multiplication of the opinion report which, as individual enthusiasm or criticism, individual experience or theorizing, does not qualify. Excluded are individual case studies and theoretical analyses. However, with the growing emphasis on the procedures of the mathematician, factor analyses have been included when the phenomena factored are clearly media-related.

The procedure adopted for finding this literature involved noting references accompanying currently published research articles dealing with each of the media under consideration. From these references topics and areas of interest to media researchers were identified and a list of fruitful publications was compiled. The full texts of the original references were located and, in

turn, examined for their particular citatations. At the same time separately published bibliographies compiled by researchers in any of a large family of fields were scanned. Since media may be used in teaching any subject, in counseling, or in any number of testing situations, and, since researchers are interested also in administrative procedures, no part of educational research can be ignored. In the same manner relevant documents can be identified in lists of theses published by individual graduate schools, by professional journals such as AV Communication Review, The Journal of Broadcasting, and Speech Monographs, or by such compilations as Doctoral Dissertations, now a part of Dissertation Abstracts.

As cited documents are actually examined, the authors, titles and pages of those accepted for inclusion in the file are entered on work sheets with a separate sheet compiled for each journal, university, or sponsoring agency source. The work sheet then serves as a photocopy order for articles available only in outside libraries or as instructions for the abstracter of research reports acquired by the Center. Since each publication source has its own work sheet and entries are added as further references are found, there is a record that can be carried to a library to prevent duplication. As abstracts are written they are filed according to author, and this furnishes a readily available means of checking for the duplication that is more difficult to avoid: that due to multiple publication.

The examination of reports, the titles of which seemed to indicate studies suitable for the file, often results in their rejection. A record is kept of these rejections to prevent needless duplication of effort.

Journal series recognized as meeting the criteria with respect to subject matter and research interest were investigated systematically. This involved reading tables of contents for the whole period covered by the project, or for whatever part of the project period they were actually published. The periodical file at one

or more libraries was also studied and various lists of education journals were perused for possible sources not cited as references or noted in any of the available bibliographies.

Such a two-track approach has proved its value. Scanning indexes reveals studies not referred to elsewhere, while noting all leads often results in consideration of articles which might not appear to be pertinent by title alone.

Many reports are received on a continuing basis from the sponsoring agencies, notably Title VII and Cooperative Research. For these documents, lists published by the U. S. Office of Education serve to ensure inclusion of all that are pertinent. Even better cooperation with university research centers, foundations and professional and commercial organizations is hoped for, to ensure the inclusion of their reports immediately upon completion.

Very often studies which were originally cited as degree or sponsored research are published as journal articles or as chapters in books or are abstracted in any of a number of publications. Those not so appearing are borrowed on interlibrary loan or requested form the sponsoring agencies.

For purposes of tabulation, selections made are recorded as units on cards as well as being entered on work sheets. A separate card is provided for each journal and each major source of non-periodical literature (Title VII, Cooperative Research, the various armed services, universities, corporations, associations, etc.). Although these categories overlap, by means of some arbitrary decisions on crediting the results of these tabulations furnish the Center and, ultimately, others interested in this area with a ready fund of major sources of educational research literature.

In tabulating, each study is entered according to the year it appeared in the particular source from which the Center's abstract was made. Thus, data are accumulated which make it possible at any time to know the number of educational media studies which have been identified from each source for

each year covered by the investigation. The results of this particular search up to the end of June 1963 are represented graphically in Appendix A. The broken line indicates studies identified as of potential value. Many of these still have not actually been examined while many others have proved to be outside our criteria or to be republications of studies already in the file. The solid line represents those accepted, abstracted and recorded on magnetic tape.

It should be emphasized that the scanning of forty-three years' worth of material cannot be a mechanical operation. The scanner has first to attempt to understand not only why a researcher points to certain studies done before his own, but also to sense the kind of research findings, from studies in education and studies in other disciplines, that have implications for the one at hand or for future investigations in related areas. With the emergence of a logic of media relatedness, the scanner has criteria for making selections from bibliographies with divergent subject matter orientations. In progressing from specific studies to the outer rim of related thought it can never be said that the end has been reached, that a final demarcation has been made in what is, after all, the single field of human knowledge. And so the scanner's task may involve returning again and again to the same sources, with different concepts in mind, as further research demonstrates the pertinency of discoveries orginally made in very different contexts.

There may be areas of research in which the scanning can be done once and for all time, but this cannot be the situation in a growing, developing realm of theory-interacting-with-practice such as the educational field, where the practical constructs of today may have their roots in the theory of half a century ago.

II Preliminary Inclusion Criteria

The file of research at the Center for Documentation and Communication Research includes studies of, and related to, utilization of the new educational media within intentional, human learning situations employing meaningful materials.

Educational, in the sense in which it is used here, refers to measurable informational and attitudinal changes and changes in certain complex skills resulting from a process which takes place in, or is comparable to the procedures of, public and private academic systems. Thus the first criterion of literature selection states that the findings of any study must be relatable to the educational process in this sense.

Closely related, but excluded from the file are areas better classed as diagnosis and therapy. Although the line is not exact, it must be recognized in making selections from the variety of media uses which are subjects of research. One example is the use of motion pictures for projective testing. The testing may be done in an educational setting, and the psychological factors thus revealed influence academic achievement. However, the process of modifying them is therapy. Another example is the use of motion picture techniques in the diagnosis of articulatory disorders. The physiological processes analyzed respond to training, but a kind of training which is not considered within the framework of the Center's definition of education. A similar use of photographic techniques in eye movement studies is included. If the premise is granted that there is a direct relationship between eye movement patterns and visual apperception and so, in turn, all learning in the visual mode, then analysis of these patterns becomes a procedure for measuring changes in various skills, particularly reading ability.

Newer media as specified for this project are those which have been made possible by technological advances, especially in the area of electronics. They include those employing the auditory mode (such as radio and various kinds of recordings),the audio-visual (comprised of sound motion pictures and television),

and those in the visual mode, in so far as they make use of projected images. Pictorial representations such as illustrations are not included, but, with the utilization of pictorial displays in teaching machines, they may have to be added. Embraced in the selection are mechanical and electronic tachistoscopic devices, simulators, computers, teaching machines and programmed materials. Programming may be in the auditory or the visual mode, and presentation may be by means of texts or by electronic or mechanical devices.

Animal studies have not been included in the file. By the word intentional the Center has excluded the learning that takes place incidentally in the school situation as well as in all other experiences. Research in the subtle informational and attitudinal changes which result from media use for entertainment and advertising purposes are also excluded.

Learning is interpreted as meaning a process, involving some degree of ideational organization, the results of which are subject to immediate or delayed measurement in terms of informational or behavioral change. On the basis of such a definition the Center excludes stimulus-response studies in which the correctness of the response is arbitrary. That is, unless there is objective validity, even if only within the relationships established for a particular experiment, the study does not fall within the present criteria. Excluded also are investigations of learning or training in which the response is verbal or motor behavior in the immediate, reactive sense. These distinctions implied by the Center's use of the word learning are far from sharp, and will need further delineation. Other types of research not in the file are maze studies, sorting, monitoring, tracking, and trial and error concept formation studies. The limitations imposed by meaningful materials exclude experiments using nonsense syllables or shapes or subliminal stimuli.

The above demarcations have been deemed necessary for a media file in its developmental stage, since the devices enumerated have such divergent frames of reference that the areas of relatedness become almost endless.

In order to chart these areas better, a division is made between media-associated factors and human-associated factors which are significant for media research.

The latter group may be subdivided into those basic to any educational research and those which take on added significance because of media utilization. The affective relationships of any of these factors as variables within the dynamics of educational effectiveness, or with implications for that effectiveness, could be the subject of research selected for the file whether or not the experiment employs one of the media. The findings, however, must be deemed sufficiently independent of the experimental conditions to be transferable to media use. The teaching machine concept, for example, because of its emphasis on structuring or programming, heightens the importance of temporal, associative, textual and meaning relationships. These may all be investigated using non-media procedures, such as the direct oral situation, or using media materials not included in this study, such as the conventional printed page.

Audio-visual devices, including the auditory and visual aspects of teaching machine displays, have their own implications. Their effectiveness may be modified by such production variables as figure-ground relationships, by characteristics of the environment affecting visual and auditory perception, and by various aspects of these perceptual processes such as speed, span, organization and memory. An example of a study deemed relevant would be one involving the relationship between mental age and speech sound discrimination. The findings of this study have implications for the selection of verbal elements in relation to the grade level at which use is to be made of educational radio, television, recordings and sound motion pictures. According to existing criteria, perceptual measurements in which, for example, thresholds are established under varying conditions are not selected.

Perceptual factors are relevant also to tachistoscopic training. Such training contributes to educational objectives through improvement in sensory perception and thus, indirectly, to learning techniques involving observational abilities. Experimental variables associated with this type of training include both visual and meaning characteristics of the practice materials, while evaluation of the resulting skills forces examination of the relationship between speed and comprehension.

The newer auto-instructional devices, teaching machines and programmed materials, have implications which extend in yet other directions. Programming is ordering according to principles established by investigations into the learning process, while teaching machines are most profitably thought of as materializations, through technology, of these principles. Thus almost any aspect of the psychology of learning could be the subject of related research. Selected are those felt to be closest to the problems of programming. From among the media-associated factors examples are positive and negative reinforcements, cueing techniques, item relationships, and considerations relative to the construction of objective tests. From the human side, studies of such factors as inhibition, knowledge of results, practice effect, response mode and associative clustering are included. The only rigid proscription is of studies employing experimental conditions which are judged incompatible with the use of self-teaching media.

Computers are considered media when they are used as teaching machines and not as practice devices. Simulators are necessarily practice devices, but research studies are included when comparison is made between their use and that of other means of teaching such complex skills as those in driver and flight training.

Some of these media serve in mass communication. In that capacity they are of interest to the educator as they affect academic performance or closely related activities such as reading habits. Such studies form a part of the file. Uses for public relations, even of the school board to the community, and for political propaganda are not considered within the bounds of educational media research. Associated with this area is the consideration of recorded or radio music as an environmental condition. Included is such research when it relates this use to the learning process, especially as that process is defined by comprehension and retention.

Certain studies with implications for educational media research in which the criteria are not learning or attitude change but contributory factors are included: e. g., communications studies in which the criterion is intelligibility and studies

in ergonomics in which the criteria are amount and accuracy of information transmitted by display arrangements. Factors which may be transferred to the educational situation are isolated in such studies, just as learning factors, isolated under the artificial conditions of laboratory experiment, are transferable to school room procedure.

The bases of selection have been extended from studies of actual media utilization to investigations, under conditions not involving their use, of media-associated and media-relevant human-associated factors. The purpose has been twofold: to find evidence related to the assumptions upon which the experimenter in the media field builds his hypotheses and to document the limits placed upon experimental results by the nature of the factors involved. The current file represents an accumulation resulting from individual decisions based on populations, procedures, materials, media-relatedness, and areas of effect.

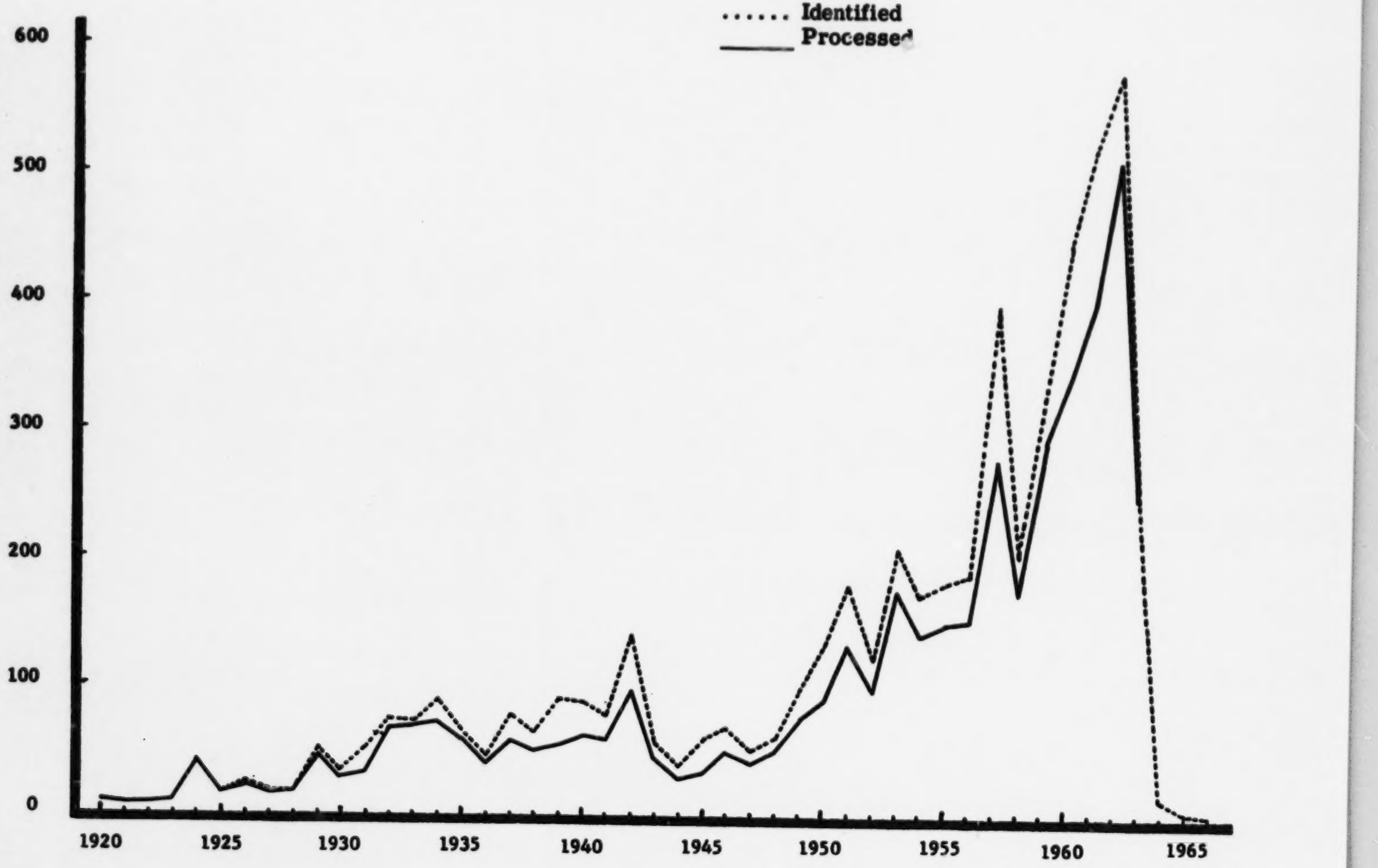
Conclusions

Within the limits of the present criteria, a comprehensive machine searchable file of media-related educational research from 1920 to the present has been established. It will be necessary to delineate further these criteria and to establish a rationale for inclusion as outlined in the introduction of this report.

This report represents a portion of the Center for Documentation and Communication Research's work in the development of an Educational Research Information Center.

Appendix A.

Media Research Studies Identified and Processed



Appendix B.

Figure 1.

U. S. Office of Education: Cooperative Research Reports

Year	No. Selections	Year	No. Selections	Year	No. Selections
1920		1936		1952	
1921		1937		1953	
1922		1938		1954	
1923		1939		1955	
1924		1940		1956	
1925		1941		1957	
1926		1942		1958	2
1927		1943		1959	5
1928		1944		1960	3
1929		1945		1961	7
1930		1946		1962	5
1931		1947		1963	5
1932		1948		1964	2
1933		1949		1965	2
1934		1950		1966	1
1935		1951			

Total 32

Figure 2.

U. S. Office of Education: Title VII Reports

Year	No. Selections	Year	No. Selections	Year	No. Selections
1920		1935		1950	
1921		1936		1951	
1922		1937		1952	
1923		1938		1953	
1924		1939		1954	
1925		1940		1955	
1926		1941		1956	
1927		1942		1957	
1928		1943		1958	
1929		1944		1959	5
1930		1945		1960	48
1931		1946		1961	53
1932		1947		1962	58
1933		1948		1963	39
1934		1949		1964	8
				1965	1

Total 212

Figure 3.

U. S. Government (excluding Cooperative Research and Title VII)

Year	No. Selections	Year	No. Selections	Year	No. Selections
1920		1935	4	1950	4
1921		1936		1951	25
1922		1937	6	1952	2
1923		1938	5	1953	5
1924	3	1939	11	1954	24
1925		1940	16	1955	28
1926		1941		1956	24
1927		1942		1957	81
1928	1	1943	2	1958	8
1929	2	1944	1	1959	10
1930	6	1945	2	1960	23
1931	12	1946	4	1961	50
1932	11	1947		1962	58
1933	6	1948		1963	8
1934	4	1949	1	1964	

Total 447

Figure 4.

Journal Series: Articles and Abstracts

Year	No. Selections	Year	No. Selections	Year	No. Selections
1920	10	1935	42	1950	66
1921	5	1936	27	1951	79
1922	8	1937	45	1952	55
1923	8	1938	37	1953	113
1924	11	1939	45	1954	83
1925	18	1940	45	1955	83
1926	14	1941	45	1956	90
1927	18	1942	46	1957	145
1928	17	1943	42	1958	66
1929	37	1944	25	1959	177
1930	18	1945	31	1960	138
1931	22	1946	45	1961	197
1932	57	1947	39	1962	202
1933	44	1948	40	1963	56
1934	64	1949	53	1964	

Total 2, 508

Figure 5.

Published Books

Year	No. Selections	Year	No. Selections	Year	No. Selections
1920		1935	6	1950	3
1921	1	1936	1	1951	4
1922		1937	1	1952	2
1923		1938	2	1953	6
1924	26	1939	2	1954	4
1925	1	1940	2	1955	
1926	2	1941	4	1956	
1927		1942	65	1957	6
1928		1943	1	1958	16
1929	2	1944		1959	3
1930		1945	1	1960	23
1931	2	1946	3	1961	10
1932		1947	1	1962	62
1933	8	1948	1	1963	
1934	1	1949		1964	

Total 272

Figure 6.

Doctoral and Masters' Theses

Year	No. Selections	Year	No. Selections	Year	No. Selections
1920		1935	10	1950	51
1921	1	1936	17	1951	66
1922		1937	24	1952	51
1923	3	1938	21	1953	73
1924	1	1939	30	1954	47
1925	1	1940	28	1955	62
1926	5	1941	24	1956	61
1927	3	1942	28	1957	63
1928	2	1943	14	1958	45
1929	4	1944	13	1959	86
1930	5	1945	13	1960	66
1931	11	1946	17	1961	84
1932	6	1947	10	1962	87
1933	15	1948	23	1963	60
1934	18	1949	44	1964	

Total 1, 293

Figure 7.

Other *

Year	No. Selections	Year	No. Selections	Year	No. Selections
1920		1935	2	1950	7
1921		1936	1	1951	3
1922		1937	1	1952	7
1923		1938	2	1953	11
1924		1939	2	1954	8
1925		1940	1	1955	5
1926	3	1941	5	1956	10
1927		1942	1	1957	13
1928	1	1943		1958	59
1929	5	1944	1	1959	33
1930	4	1945	13	1960	110
1931	3	1946	1	1961	60
1932	2	1947	2	1962	55
1933		1948	2	1963	10
1934		1949	2	1964	

Total 445

* University non-degree studies, state, county, city school district studies, association, foundation and corporation studies.